

ADAPTIVE BUS VOLTAGE POSITIONING FOR TWO-STAGE
VOLTAGE REGULATORS

ABSTRACT OF THE DISCLOSURE

Alteration of voltage input to a voltage regulator output stage from a V_{bus} regulator stage in a two-stage voltage regulator provides optimal V_{bus} voltage placement for a wide range of current loads to increase voltage regulator efficiency and is particularly suited to CPUs having power-saving sleep modes of operation. An optimal voltage is selected or developed in response to information concerning operational mode or current consumption of the powered device. As a perfecting feature of one embodiment of the invention in which a discrete V_{bus} voltage is selected based on operational mode, the selected voltage is adjusted to further optimize the matching of the V_{bus} voltage placement to the load and provides a continuous range of voltages. In a second embodiment the entire V_{bus} positioning function is performed in response to current load information. A feed-forward arrangement is provided to avoid transient spikes as the V_{bus} voltage placement is altered.